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Sharing and Reusing Learning Designs: Contextualising Enablers and Barriers

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Abstract: Reusing learning designs created by successful teachers is a means of sharing innovation and exemplary lessons whilst at the same time conserving resources. It would seem beneficial, therefore, to encourage and promote this practice. Repositories exist to support reuse and the sharing of exemplary learning objects and learning designs, however, there is little evidence of widespread adoption by teachers and pre-service teachers. This case study discusses the development of an environment conducive to sharing and reuse created in a pre-service teacher education course over a two-year period. Issues of pedagogy and the perspective of staff and students in this context are discussed.

Keywords: pre-service teachers, sharing, learning design, reuse, templates, modeling

Introduction

For educators, reusing learning designs of another experienced and/or successful teacher is a means of sharing innovation and best practice, whilst at the same time conserving resources. It seems reasonable, therefore, to suggest that the sharing and reuse of good teaching methods and exemplary learning designs should be encouraged and promoted. The practice of reuse of resources could be expected to be especially beneficial for inexperienced teachers where the process of documenting and/or producing a replicable lesson or learning design requires much time, reflection and support.

In an attempt to promote and enable sharing and reuse, an increasing number of repositories are being established within institutions and across educational communities (eg. MERLOT, The Le@rning Federation, BECTA, CLOE, Ariadne, the Apple Learning Interchange). Many of these repositories contain excellent examples of learning objects and other digital resources potentially useful to lecturers, teachers and pre-service teachers. However, repositories are currently reportedly under-utilised (Campbell, 2003; Margaryan & Littlejohn, 2007). Consequently, if it is acknowledged that there are advantages to using repositories, can an environment be fostered that promotes their use? By encouraging sharing and reuse of good teaching practice at an early stage in a teacher's career and modeling it as everyday practice, the tutors of a second year Teacher Education course, at Macquarie University, a metropolitan university in Sydney, aimed to promote a cultural and attitudinal change to the idea of sharing learning designs amongst their students. Novice teachers are often looking for good learning designs on which to model their own teaching and learning environments. Additionally, they need the opportunity to discuss and reflect on their original designs and the designs of others to gain confidence and skills in teaching (Cameron, 2006; Kearney, 2007). By encouraging these students to exploit all that repositories have to offer, the tutors aimed to facilitate the students' evaluation of the efficiencies, value and limitations in sharing and reuse. It was then hoped that students would take these insights with them into their professional lives.

Background: Capturing Learning Design

Preparation and sequencing of activities, organization of content and consideration of the roles adopted by students and teacher are central elements of planning for learning. The concept of creating a learning design is familiar to all teachers (Britain, 2004): it is what teachers do each time they prepare for a class. They design the learning that will take place in a given time frame. Lesson plans or learning designs are patterns for action: a sequence of activities, incorporating resources and tasks. Learning design patterns should embody "educational values and vision" (Goodyear, 2005, p.82). These patterns provide a reproducible and sharable template that can be represented in a variety of ways: graphically, textually, or in codable, machine-readable form.

A number of research teams have produced work in this area. For example, the learning design exemplars developed by Oliver, Harper, Hedberg, Wills and Agostinho (2002) for the Australian Universities Teaching Committee (AUTC) project (http://www.learningdesigns.uow.edu.au/) are temporal representations defined by three key elements: tasks, resources and supports. Bennet et al (2007), have built on the AUTC work, aiming to progress towards an integration of the pedagogical design process and international e-learning standards. The Pedagogical Patterns Project in the United Kingdom also offers a range of learning design examples (see http://www.pedagogicalpatterns.org/). In the UK project methodologies for capturing best practice have been investigated which can be migrated from one domain to another.

According to Laurillard and McAndrew (2002), to be really useful, sharing of good pedagogy should be undertaken in a holistic way: there should be full transference of the learning design with detailed information about intended outcomes, modeling of the learning experience and the context of implementation. That is, a learning design is more transferable when it is not de-contextualised, and the conditions of learning are specified. Interestingly, those investigating learning *objects* are becoming more concerned with the value of the underlying learning design of such resources. Boyle (2006) suggests that in terms of sharing, it is this scaffold, the "pedagogical pattern", that potentially provides more opportunities for reuse than the content of learning objects themselves. He is particularly interested in the pedagogical commentary which ideally might accompany a learning object, providing a contextualized rationale for the design of the resource. This is a type of secondary metadata. Until recently it was thought that the most reusable learning objects were those that contained the least contextualized material. However, the more complex the learning outcomes expected from a particular task (such as synthesis or evaluation), the more there is a need to provide adequate contextual information if reuse is to be achieved (Wiley, 2003). This may well prove to be the case with learning designs. It is an area where further research is required. In any case, the importance of adapting and contextualizing design to meet particular student needs, curriculum frameworks, local socio-cultural influences, and institutional and professional requirements, is well known to educators and key to effective learning outcomes (Benson & Samarawickrema, 2007; Ramsden, 2005).

Methodology

This case study is a documentation and analysis of teaching practice, based on a preliminary investigation of the issues surrounding the benefits of reuse and sharing of learning designs in the classroom context. Taking an action research approach to support ongoing reflection, the authors addressed the following questions:

- What benefits can pre-service teacher education students gain from sharing and/or reusing learning designs?
- What are the barriers and enablers for students sharing their own learning designs via learning design repository services?
- What factors enable or act as barriers to staff sharing and/or reusing learning designs within the teacher education context?
- Is collaboration and peer review and mentoring an effective approach to developing, using and sharing learning designs in this context?

The following discussion draws on data gathered using survey, participant observation and focus group research methods. Two surveys were administered. The first (2006) was an online course evaluation completed by 60 students (75% of the cohort). All students were then invited to attend a focus group, and 14 students responded. To verify and validate survey responses, focus group participants were asked to expand on three of the survey questions

(see Table 1). In 2007, a second online survey using the same questions was completed by 27 self-selected undergraduate and 7 postgraduate students. Four staff members new to the course also participated in the survey on each occasion (2006 and 2007). All staff members contributed to classroom observation for the study.

Discussion

An initial investigation into whether a culture change could be effected with staff and students began during 2006. Throughout the course, tutors modeled the practice of sharing using resources from two digital repositories: The Le@rning Federation (http://www.thelearningfederation.edu.au/tlf2/) and the LAMS Community (www.lamscommunity.org, see Figure 1). The Le@rning Federation creates and licenses digital learning objects to support teaching and learning in Australia and New Zealand. They apply a rigorous quality assurance process to ensure that all resources are educationally sound. The LAMS Community is an international community website for teachers and developers who use the open source Learning Activity Management System (LAMS) for creating digital learning designs that can be run online. The LAMS Community allows teachers to share and adapt learning designs and provides forums for users to discuss their experiences. There is no quality assurance process, so designs must be evaluated for their worth and value on an individual basis. The value of encouraging students to use a repository of learning objects and a repository of learning designs together was considered by the course tutors was that the learning designs could provide the pedagogical framework around which resources and tasks could be combined and contextualized.

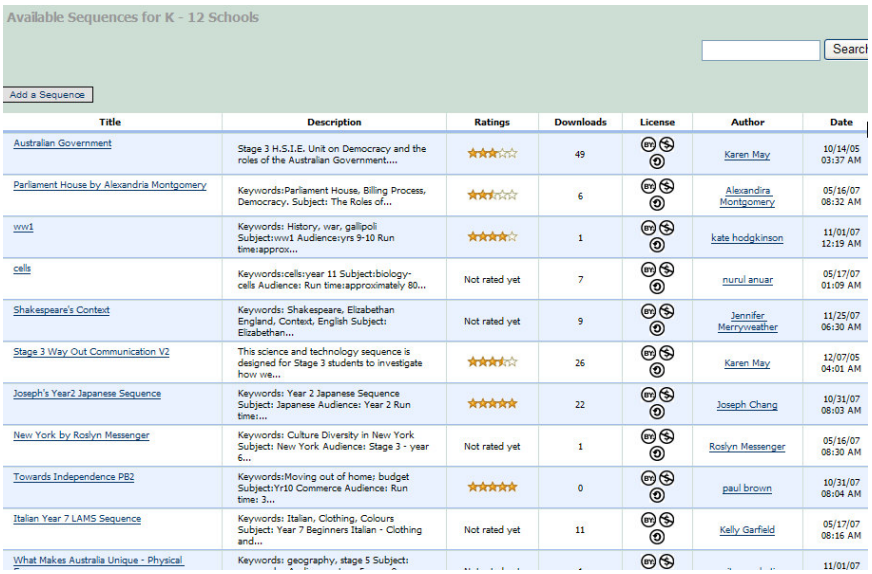


Figure 1: Sample listing of learning designs in the LAMS Community

Tutors introduced concepts throughout the course utilizing examples from the repositories on at least six separate occasions. Additionally, tutors gave the students an opportunity to de-construct and evaluate several learning designs from the LAMS Community. This allowed students to experience authentic learning designs before constructing their own which was a major part of the assessment for the course. On course completion, those students deemed by the tutors to have authored sequences of distinction were invited to upload them to the LAMS Community repository.

Benefits of Sharing and Reusing Learning Designs

As Table 1 illustrates, a majority of our participants (both students and staff) agreed there are benefits for teachers having access to a sharable bank of learning designs from which they can download models to trial and modify for their own contexts. The most common advantage of access to such repositories identified in the focus groups was that they provided a searchable database of exemplary designs which can be easily adapted. However, additional benefits of repositories in this learning context are:

- Scaffolding and mentoring for teachers new to the profession;
- Inspiration for teachers wishing to redevelop or redesign the curriculum;
- Access to archived and catalogued learning designs;
- Greater exposure to models of best practice;
- Foundation for more sustainable practices in e-learning – conservation of time and effort;
- Development of resources which support and promote communities and professional and student networks; and
- Explicit copyright licensing agreements which support equitable sharing practices.

Survey Results	**2006** n = 60		**2007** n = 27	
Students	**Agree**	**Disagree**	**Agree**	**Disagree**
I can see benefits in sharing and /or reusing learning designs	59(98%)	1(2%)	25(93%)	2(7%)
I am willing to share my own learning designs in a repository	56(93%)	4(7%)	22(81%)	5(19%)
A collaborative approach helped me develop my learning design	55(92%)	4(6%)	23(85%)	4(15%)
Staff *	n = 10		n = 12	
I can see benefits in sharing and /or reusing learning designs	9	1	10	2
I am willing to share my own learning designs in a repository	2	8	3	7
A collaborative approach helped me develop my learning design	3	7	5	5

Table 1: Survey Results (2006-2007)

* Owing to small sample size, percentages were not calculated for staff statistics.

For some, the concept behind reusable learning designs is that "an activity once specified clearly enough is reusable in a different subject matter, merely by changing the resources" (McAndrew, Weller & Barrett-Baxendale, 2006). For example, an online debate in History could have the same underlying pedagogical structure as a debate in Psychology. By changing the learning objects or resources within the learning design, the debate becomes reusable in other contexts. While this argument is appealing, and the authors have observed instances where learning designs have been reused in this way, there is evidence that there may be a greater tendency for teachers to repurpose learning designs in an amended form for the new context, rather than taking the template and using it "as is". Research findings in both Australia and the United Kingdom corroborate this. In each case, learning designs created using the LAMS software were more likely to be used by university teachers, not in their original form but as models for their own original designs (Philip, 2007; Walker & Masterman, 2006; Lucas, Masterman, Lee & Gulc, 2006). It is suggested that teachers are using the designs for inspiration and modeling, rather than direct transference.

Willingness to Share One's Own Designs

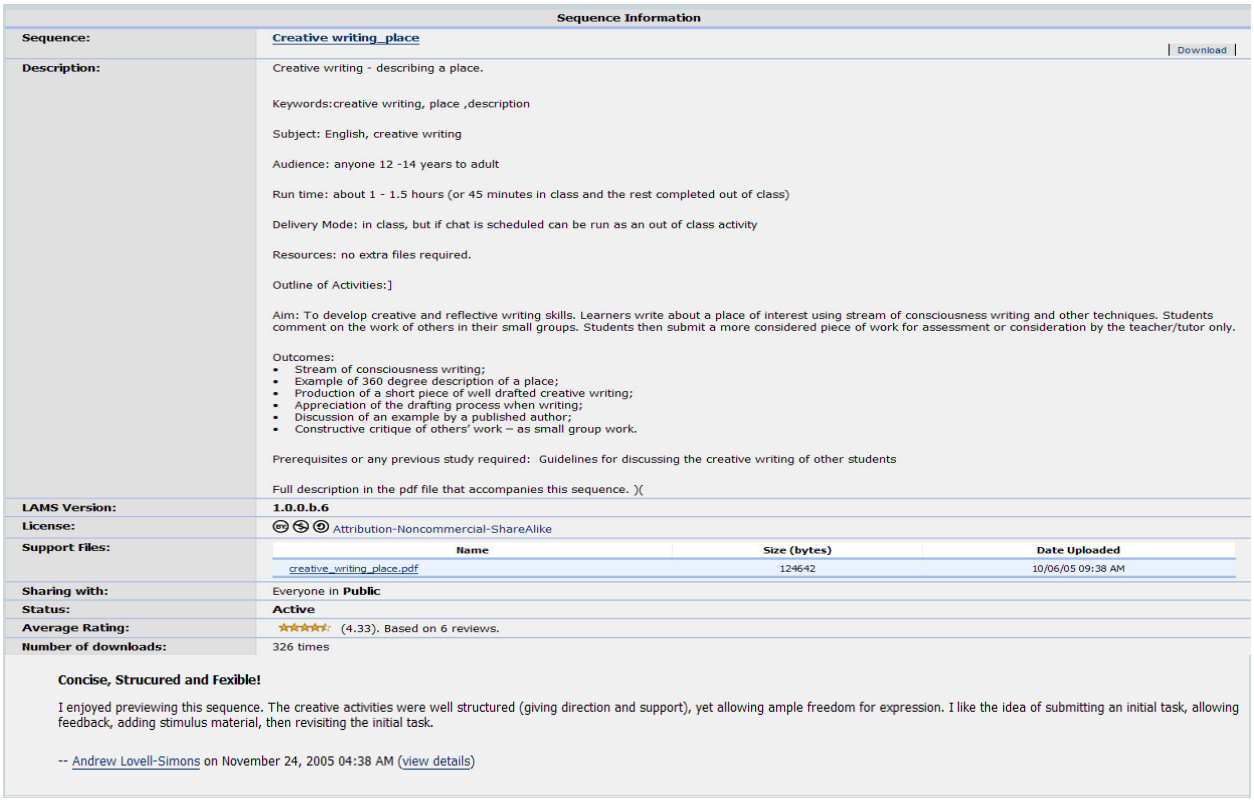
The survey results indicated that students were strongly in favour of sharing learning designs (see Table 1 above). They were comfortable with both using learning designs from repositories and contributing their own designs for others to use. The students recognized that the comments critiquing their learning designs published on the repository website were a means to improve their designs and were welcomed (see example Figure 2). However one student mentioned that these comments should be thoughtful and constructive, but not anonymous. This openness towards peer review and the process of commenting on other's contributions is consistent with observation of how the students are engaging with the Web 2.0 technologies (eg. Facebook, myspace, blogs) in their own personal time.

Koper (2003) identifies three levels of reuse of learning objects: (1) reuse of resources created by oneself as the author; (2) reuse of resources created by someone within the same community or organization; and (3) reuse of resources created by another from an external community. These three levels, applicable to learning objects, could be applied to learning designs. Additionally, they may well be influenced by issues of trust and preparedness to share. In our study, the majority of students were comfortable sharing learning designs created by themselves and others within the classroom and from the LAMS Community at levels 1, 2 and 3, but due to the licensing limitations of the Le@rning Federation, they were limited to level 3 use of the learning objects available from that repository.

In contrast, the tutors acknowledged themselves as more conservative regarding sharing. The responses from staff on the question of sharing personal learning designs were markedly different to that of their students (only two staff members were willing to share their learning designs compared with 56 students (93%)). Staff comments indicated they were more concerned that their work would be judged harshly and were unlikely to put up "work in progress". One staff respondent mentioned legal recourse as a reason for being reluctant to widely publish designs. This concern with standards, licensing and the tension between academic culture and the desire to share and reuse resources has been identified in the literature (e.g. Campbell, 2005; McNaught, 2005; Pennell, 2007). Whether these students will reuse learning designs and lesson plans created during their pre-service years in classrooms with their own students, or reuse learning objects sourced from the Le@rning Federation site is unknown at this time, and an area for future research.

There is an acknowledged gap between teachers' professed positive attitudes towards sharing teaching and learning resources, including learning designs, and the actual practice of reuse (Walker & Masterman, 2006; Woo, Gosper, Gibbs, Hand, Kerr & Rich, 2004). The factors are complex surrounding the sharing and reuse of resources. The literature consistently suggests that issues relating to socio-cultural and pedagogical issues will be the most difficult to address (McNaught, 2003; Margaryan & Littlejohn, 2007). Further, while teaching staff want to make their work available to others, they do not want to be any busier, they need to be able to control ownership of resources they have created, be assured of the security of their resources and have easy access to them, and avoid the possibility of copyright infringement (Foster & Gibbons, 2005). Also, interoperability and portability are key considerations affecting reuse. For example, Lloyd and Butcher (2006), reporting on their experience of reuse of a specially customised role play simulation for Geography students, noted that migration of the simulation from one institution to another, across two different learning management systems, was not straightforward. It had significant financial implications, and the support of educational designers and experienced users of the system was essential to the migration. Development time and the enthusiasm of the team members involved in the project were key success factors impacting on the successful outcomes of the reuse project.

With regard to intellectual property rights, when uploading their sequences to the LAMS repository, most students reported that they gave permission for reuse of their resources under an attribution, non-commercial, share alike Creative Commons license (http://creativecommons.org). This is consistent with the findings in the Elliott and Sweeney (2007) case study of reuse, where generally authors were willing to share their materials under the same licensing conditions – with acknowledgement of the author, on the condition that it was for educational, not commercial use, and with the assumption that if the work was altered, transformed, or built on, the resulting work was distributed under a similar licensing agreement. However, not all staff in our study were ready to do the same.



Sequence Information

Sequence:	Creative writing_place	Download
Description:	Creative writing - describing a place. Keywords:creative writing, place ,description Subject: English, creative writing Audience: anyone 12 -14 years to adult Run time: about 1 - 1.5 hours (or 45 minutes in class and the rest completed out of class) Delivery Mode: in class, but if chat is scheduled can be run as an out of class activity Resources: no extra files required. Outline of Activities:] Aim: To develop creative and reflective writing skills. Learners write about a place of interest using stream of consciousness writing and other techniques. Students comment on the work of others in their small groups. Students then submit a more considered piece of work for assessment or consideration by the teacher/tutor only. Outcomes: • Stream of consciousness writing; • Example of 360 degree description of a place; • Production of a short piece of well drafted creative writing; • Appreciation of the drafting process when writing; • Discussion of an example by a published author; • Constructive critique of others' work – as small group work. Prerequisites or any previous study required: Guidelines for discussing the creative writing of other students Full description in the pdf file that accompanies this sequence.)(
LAMS Version:	**1.0.0.b.6**
License:	Attribution-Noncommercial-ShareAlike
Support Files:	Name: creative_writing_place.pdf; Size (bytes): 124642; Date Uploaded: 10/06/05 09:38 AM
Sharing with:	Everyone in **Public**
Status:	**Active**
Average Rating:	(4.33). Based on 6 reviews.
Number of downloads:	326 times

Concise, Strucured and Fexible!

I enjoyed previewing this sequence. The creative activities were well structured (giving direction and support), yet allowing ample freedom for expression. I like the idea of submitting an initial task, allowing feedback, adding stimulus material, then revisiting the initial task.

-- Andrew Lovell-Simons on November 24, 2005 04:38 AM (view details)

Figure 2: An example of reviewer's comment on a learning design in the LAMS Community

Factors Contributing to an Environment that Fosters Sharing and Reuse

Students and staff engaged in a peer review process of evaluation using both workshopping and formal written evaluations of each other's work. This was integral to the assessment process. Taylor and Richardson (2001) recommend that three forms of evidence should be presented for peer review of educational resources: documentation outlining the design considerations, an overview of the resource, and reflection on the resource. The students in this study were required to provide written evidence of each of these forms with their final submissions. The requirement for multiple levels of review and documentary evidence was encouraged with the aim of raising the level of critique and exposing designs to scrutiny and development in a safe learning environment. The iterative dialogue about the process was in keeping with a social constructivist approach to learning.

Discussion and observation of exemplary learning designs created by others has been observed by the authors to challenge conceptions of learning and teaching, at the same time promoting the development of good practice. Designing for online environments often challenges assumptions about teaching and learning, and "working with online learning technology lends itself to a team-oriented, collegial approach" (Gray & McNaught, 2001, p.217). When teachers and support staff work together collaboratively on the development of online resources there is an opportunity for professional development and mentoring that can benefit all participants as experts and novices work together. In addition, this sharing and discussion of learning designs as an enabler for professional development has been observed to be beneficial for pre-service teachers when developing their first designs for online learning with students in primary (elementary) or secondary (high) schools (Cameron, 2006; Kearney & Young, 2007).

Other elements that may assist in the mentoring process include meaningful secondary metadata accompanying the learning design, providing insights into the rationale behind it, creating and assisting with the transference from one context to another (Lucas, Masterman, et al., 2006). Additionally, Walker and Masterman (2005) emphasize the key role played by staff in the mentoring process, enabling important design features and outcomes of the learning design to be fully realized. From the authors' experience, the discussion about the advantages and disadvantages of

the learning design, the pedagogical and technical modifications that are required and the expected impact on implementation bring short- and long-term benefits regarding professional development. Where our pre-service teachers' skills and understanding of pedagogical models were concerned, this mentoring and scaffolding role was taken on by the course tutors. Dialogue with the teacher and peers is an important developmental and processing skill.

Barriers to an Environment that Fosters Sharing and Reuse

Course design for students in this study went through a number of iterations gradually working at overcoming the barriers to sharing with peers: a safe, supportive, and collaborative environment was created where participation was integral and the problems authentic. To be consistent with the promotion of a sharing culture, class time was provided so students had an opportunity to workshop their learning designs. Students showcased their work with their peers, and constructively commented on each other's designs, collaboratively problem-solving any difficulties. Another amendment made was to give *all* students the option of uploading their learning design to the LAMS Community, regardless of the grade achieved (previously tutors selected which student's work was uploaded to the repository). It was realised by the tutors that this was more consistent with modeling and promoting a culture of sharing: even though a design might need further development, it can still provide inspiration and be reused by others. This met with an enthusiastic response from the students and 70% of students elected to upload their work (refer Table 2).

Year	Number of designs contributed	Method of contribution
2005	12 designs of 120 cohort (10%)	Course tutors selected which designs were uploaded
2006	35 designs of 98 cohort (36%)	Students own choice to upload their design
2007	60 designs of 78 cohort (77%)	Students own choice to upload their design

Table 2: Number of student designed sequences uploaded to LAMS Community

Some barriers to reuse and sharing could not be resolved by course tutors. The most common was the ease of editability of the learning design or learning object from the repository. Contrary to the findings of the study by Oliver and McMahon (2006) where teachers were not inclined to customize learning objects sourced from the repository, a majority of students and staff in this study found a high number of learning designs and learning objects from the repositories needed changes to ensure currency and suitable contextualization for their particular teaching and learning environments. Editing is not permitted with Le@rning Federation resources due to licensing restrictions. This limited the usefulness of the repository to students and staff. By comparison, the LAMS Community learning design repository, with its Creative Commons licensing, offered a bank of sharable and customizable designs that could be readily modified. This was an important aspect of sharing and reuse observed amongst our students, as many designs were heavily edited and contextualized after selection, the original sequences mainly being used as inspiration to develop students' own custom-built sequences.

Another barrier to reuse observed was the ease with which suitable designs could be readily located within a repository. Difficulties were experienced with both repositories. Discoverability and accessibility are paramount enablers for reuse. If a good description of the learning object accompanies the resource this also aids discovery and selection (Oliver & McMahon, 2006). Further, students and tutors observed that the repository must be of a size that provides the user with regular success in a search of keywords or terms. Studies in the literature corroborate this need for a critical mass of relevant resources to enable reuse (Bower & Appleby, 2005; Oliver & McMahon, 2006). The lack of suitable learning designs was a problem in the early years of the LAMS Community. Student learning designs were not tagged as student designs when contributed to the Community, although the first set edited and uploaded in 2005 by one of the teaching academics was identified as student generated resources. After discussion with students in subsequent years, however, where issues of standards, copyright, credibility and authorship were considered, the responsibility for contribution was left with students, who agreed to upload their own designs and attend to those issues themselves.

Conclusion

In terms of our research questions, students saw benefits in sharing and reusing learning designs, and were willing to share their own designs via a repository linked to an external community. The benefits observed included process support (scaffolding, inspiration and mentoring); facilitated access to a variety of learning designs (exemplary and works in progress); contribution to sustainable practices (time, effort and resources); and engagement with an emerging community of practice. Undoubtedly the collaborative approach to creating and refining learning designs followed in this context was beneficial. Students shared their work with peers in small groups and commented on the efficacy of each pattern of activities, thereby strengthening design development. Students had to explain, justify and defend their pedagogical decisions in a peer review environment.

The use of online technologies to support the discovery of learning designs and learning objects, and the creation of easily customisable and testable learning designs has focussed student evaluation and critique of other's work. In future iterations of the course, students will be encouraged to share their comments on other's designs with the wider online community, not just their own smaller learning community. This may require more support and encouragement, and may raise issues of trust and credibility, which could be explored in later research.

A number of barriers and enablers to sharing and reuse were documented in this context.

Enablers to sharing learning designs amongst pre-service teachers included:

- Formalised peer review where evaluators (students and their teachers) collaboratively document, overview and reflect on pedagogical designs;
- An iterative process of dialogue amongst those sharing designs which supports critique and evaluative processes;
- A collegial and supportive environment –facilitated by course tutors - that encourages small group collaboration and constructive criticism of designs, whether exemplary or works in progress;
- Meaningful secondary metadata accompanying the learning design, which assists with contextualizing a design and transference from one context to another;
- Modeling a culture expected in a professional context where all designs can be shared, not only those designs deemed to be the best; and
- Ensuring students understand that issues of standards, copyright, credibility and authorship are their personal and professional responsibility, as contributing members of a learning community.

Barriers to sharing and reuse amongst pre-service students included:

- Permitting only those designs that are regarded as the best from each cohort to be uploaded to a repository of sharable resources;
- Lack of the ability to easily customize and edit learning designs or learning objects to ensure currency, or so as to better suit the subject area, grade level and learning context;
- Poor or inadequate search and discovery tools within the repository - if it cannot be found it cannot be reused or shared;
- Insufficient examples within the repository, thereby limiting selection and choice.

The students' willingness to share and constructively critique the work of others was in marked contrast to the attitude expressed by staff. The more conservative attitude of staff indicates their awareness of and concern with issues relating to ownership, standards and licensing. While teaching staff may be affected by the many socio-cultural barriers that impact on sharing and reuse of digital resources, this study shows that within the context of the pre-service teachers' classroom, progress can be made towards changing the prevailing culture, at least from the point of view of students. Encouraging sharing and reuse of good teaching practice early in a novice teacher's career, and modeling it as everyday practice, may encourage them to be more open to this practice in their professional lives, and encourage others in the wider community to contribute in the same way. An area for future research could include investigation of students into their first years of teaching, in order to discover how effective that modelling has been in the long term.

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